Lean IT workstations: thin and zero clients send TCO plummeting

Virtualization and cloud computing have revolutionized IT practice. IT workstations can now be provided even more efficiently and flexibly than in the past. In combination with remote-administrable thin and zero clients, overall workstation-related costs are reduced to a minimum.

Contents:

- What potential for reducing costs does cloud computing in combination with thin and zero clients offer?
- How can the overall workstation-related costs (TCO) be calculated?
- What other fine tuning is possible in order to further reduce the TCO?
- How can investment protection be assessed?
- What role does remote management play?
- Outsourcing: What opportunities does Client as a Service (ClaaS) offer?
- How can it be introduced quickly and at low cost?

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The way in which companies and government agencies provide their IT has been undergoing huge changes for a number of years now. With the help of virtualization, applications and desktops can be bundled together in the computer center and provided locally with never-before-seen efficiency. At the same time, there is the possibility of comprehensively outsourcing IT operations as a service as part of XaaS[1]. Regardless of whether companies provide their services via a self-managed private cloud or using a hybrid cloud with their own and external IT services, the traditional, high-maintenance workstation PC is no longer required. At modern workstations, PCs which date back to the 1980s and are also referred to as "fat clients" owing to their extensive hardware are being replaced by a thin or zero client with standardized remote management in order to further increase the cost saving potential of cloud computing.

Thin and zero clients are becoming standard

A number of organizations including the Borderstep Institute for Germany have found out that thin and zero clients are increasingly becoming the standard when accessing centralized or hosted applications and desktops[2]. According to the Borderstep Institute, the number of company PCs in Germany fell slightly in 2014, while the number of thin clients rose by more than 25% to reach 2.9 million devices. These figures include zero clients which, by definition, are thin clients optimized for specific VDI environments. In addition, another 300,000 or so "software thin clients" – PCs converted into a thin client via software – are in use nowadays. In most cases, older devices which still work and offer adequate performance for a thin client but were taken out of service as PCs are used for this purpose. According to market figures from IDC, around 481,000 new thin clients were procured in Germany, the most important sales region in Europe, in 2014. This represents an increase of around 22%. Globally, approximately 5.5 million devices were sold.

New: mobile thin clients and ClaaS

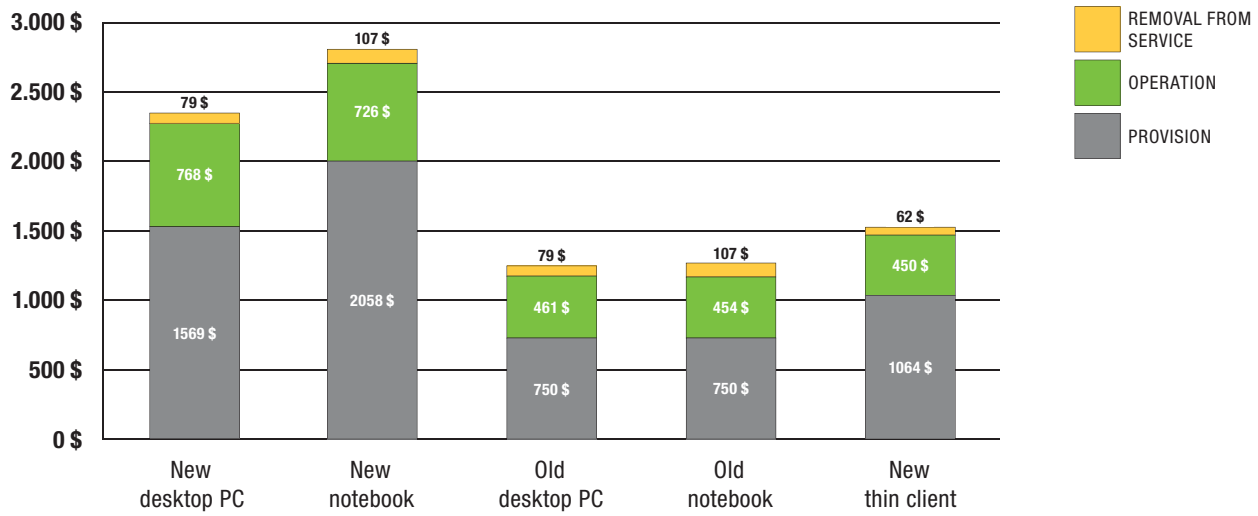
In addition, further developments from the various providers are demonstrating that thin clients, zero clients and software thin clients are suitable for use not only in offices but also at external sites, at service providers and suppliers, in home offices as a VPN client or on the move as mobile thin clients. For users, this means efficient, secure and flexible access to their virtual working environment – which runs either within their company's own data center or as part of a Desktop as a Service[3] model at a provider. If the end device including remote management is part of the agreement too, this is commonly referred to as Client or Workplace as a Service[4] (ClaaS or WaaS).

Calculating the total cost of ownership

The overall costs (TCO) for a thin client infrastructure including VDI or cloud-hosted desktops depend on the planned lifespan of the devices as well as various other factors which can be subdivided into the following three areas:

1. **Procurement (server, software, network, desktop and mobile devices)**
2. **Operation (energy, licenses, management etc.) and**
3. **Removal from service / disposal**

FIG. 1: TOTAL COSTS PER CLIENT WITH 100 WORKSTATIONS TO BE SUPPORTED



Source: Fraunhofer Institute UMSICHT

The Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT has carried out an in-depth analysis of these three areas as part of a detailed efficiency study[5] for a scenario with 100 clients. It discovered that a thin client is 35 percent cheaper than a new Windows PC (fat client) offering similar functions over a relatively short operating period of three years. In the case of a software thin client, savings of 47 percent are possible. If a new notebook is compared to a mobile software thin client, the difference is as much as 55 percent. If a longer comparative period as would be the case in a real situation is used, the savings are correspondingly higher. After all, hardware thin clients are often in use for five or six years or, in isolated cases, for as many as eight to ten years.

Differences according to company size

What absolute savings can be made compared to when using a PC network depends to a large extent on the number of users. In the above scenario with 100 users, a Windows PC incurs costs of approx. $2,417 over a three-year usage period. In contrast, the hardware thin client costs $1,578 and an older PC operated as a logical thin client approx. $1,292. Owing to economies of scale, the following figures apply for a very large company with 15,000 IT workstations: the overall costs are approx. $1,748 for a desktop PC and approx. $2,124 for a notebook. In contrast, an older desktop PC operating as a logical thin client costs approx. $1,063, a notebook operating as a logical thin client approx. $1,089 and a hardware thin client $1,280. If, in an ideal scenario, a company with 100 clients converts all existing old devices into logical thin clients instead of investing in new end devices, it will save over $112,558 per year or can use this money that would otherwise be tied up for other investments. Accordingly, a company with 15,000 clients could reduce its work-related overall costs by $10,3 m.

Further increasing the effects: client standardization

Thanks to recent progress in the field of virtualization technology, the idea that thin clients make economic sense primarily at stationary standard workstations is outdated. Nowadays, even high-performance computing, e.g. for CAD[6], GIS[7] or video editing, is possible using a thin client. In addition, the increasing availability of wireless networks is providing the basis for notebook-based mobile software thin clients. Thanks to these developments, thin client concepts can be achieved across even greater areas, thus boosting the cost effects. For special user scenarios, the local software on the thin / zero clients also plays an important role. For example, the German market leader IGEL with its Universal Desktop models and the Universal Desktop Converter 2 (UDC2) thin client software even supports digital dictation systems including peripherals or multi-screen workstations. All-in-one devices comprising a monitor and a thin client unit help to save additional space.

Killer application: unified remote management

From a cost point of view, the most important component in a thin client environment is the remote management solution. In this discipline, thin and zero client solutions beat Windows PCs when it comes to costs. The actual savings that can be achieved in reality depend on the extent to which typical management tasks can be automated – from the rollout to the commissioning of a replacement device should a device fail. Solutions that can manage various thin client models and operating systems in a standardized, profile-based manner offer the biggest potential for savings. Via a graphical user interface – the UMS Console in the case of IGEL – the settings profiles can be set up before the rollout and then passed on automatically using the MAC or IP address. In the event that a device is replaced, the newly connected thin

EXAMPLE CALCULATION: TCO FOR 100 CLIENTS OVER THREE YEARS

CLIENT/SERVER NETWORK WITH 100 PCS	USD $	CENTRALIZED IT ENVIRONMENT WITH 100 THIN CLIENTS	USD $
Server hardware for software distribution (e.g. Lenovo ThinkServer TD 340 Tower Server with sufficient hard disk storage capacity)	4,243	Server hardware for thin client computing (e.g. Lenovo ThinkServer RD 440 2U Rack Server with 2 processors, 108 GB RAM and 4 TB SSD)	6,879
Microsoft Windows Server 2012 R2 licensing costs	651	Server-side licenses (Microsoft Windows Server 2012 Datacenter Edition, virtualized on Hyper-V, Citrix XenServer or VMware ESX)	6,990
100 business PCs (branded manufacturer, e.g. Lenovo) with processor: Intel Core i5-4570 CPU (3.20 GHz), 8 GB RAM, 250 GB SSD and DVD-RW (price: $837each)	83,749	100 thin clients (IGEL UD3 LX) (price: $37408each)	37,408
Software licenses (operating system, client access license (CAL), software distribution, applications, updates etc.)	23,450	User-related software licenses (CALs, RDS-CALs, Citrix XenApp, applications, updates etc.)	34,058
Electricity costs with an average power consumption of 66.95 kWh / year	22,428	Electricity costs (average power consumption – server: 3,282.77 kWh, thin client: 35.65 kWh)	22,939
Personnel costs: Procurement, installation, administration, disposal etc.	107,234	Personnel costs: Procurement, installation, administration, disposal etc.	49,509
TOTAL COSTS OF PC NETWORK	**241,755**	**TOTAL COSTS OF THIN CLIENT ENVIRONMENT**	**157,783**

Source: IGEL Technology; further details: „Ecological and economic aspects of software thin clients“, short title: Thin Clients 2015; Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT, 2015

or zero client contacts the UMS server and configures itself using this profile. The workstation is thus available again within minutes, unlike a PC which could take an administrator hours to set up. IGEL allows further savings with asset management which is likewise part of the supplied Universal Management Suite (UMS).

BUDGET-FRIENDLY MIGRATION TO CENTRALIZED IT INFRASTRUCTURES, VDI OR CLIENT AS A SERVICE WITH SOFTWARE THIN CLIENTS.

Software thin clients based on the IGEL Universal Desktop Converter 2 (UDC2) software help to reduce costs in the following ways:

- Low investment costs: no hardware costs for thin/zero clients
- Immediately frees up funds in the IT budget, which can be used for other investments
- Efficient, secure and site-independent remote administration of the devices
- Cost-effective creation of mobile thin clients
- Standardized management of all IGEL devices
- Dramatic reduction in administration costs

Digression: outsourcing with Client as a Service (ClaaS)

Comprehensive remote management also forms the basis for a special form of thin client use as a service (ClaaS). The key benefits compared to internal operation are the high level of cost transparency as a result of converting procurement costs to be included in balance sheets into monthly costs. As a result, even the balance sheet can be reduced. Noticeable cost savings can be made as a result of reduced complexity as well as the reduced costs of hardware, operating systems, licenses, antivirus software, updates, patches etc. The fact that data are stored and backed up more efficiently by the provider also results in further economic benefits, even if they are hard to quantify. Last but not least, thin client users and their companies benefit from a high level of operational continuity if they have the availability of workplaces and data assured contractually via service level agreements. Because applications and desktops run in an appropriately secured data center, the cloud model also paves the way towards mobile computing because the data can now be retrieved via a range of end devices.

Assessing investment protection

Finally, it is important to examine which solutions are future-proof, i.e. guarantee return on investment (ROI) as planned. Assuming that there is an efficient remote management system in place, multiprotocol thin clients are the safest choice from a technical point of view because they offer the highest level of flexibility in use. IGEL offers an extended five.year hardware warranty for the robust hardware in its Universal Desktop series. Software thin clients with the IGEL UDC 2 operating system have the advantage that they can be combined with any X86 hardware which can likewise be replaced within minutes if necessary. Installed on existing PC hardware, they offer a low-cost introduction to the world of thin client computing. When selecting zero clients, it is important to examine the IT strategy in detail. If changes in technology are possible in the future, proprietary devices should not be used. An alternative here are zero clients which offer an upgrade path to a multiprotocol thin client. Further measures which increase investment protection for customers include German-language and international support as well as regular firmware updates. Important updates are even published up to three years after an item of hardware is discontinued.

Conclusion

Compared to PC networks, workstation infrastructures with thin and zero clients offer great potential which can be assessed in more than just monetary terms. In combination with cloud technologies, they not only improve data security, availability and scalability but also pave the way towards mobile computing. Remote management takes on a key role in any assessment of economic viability. It also has a significant influence over usage fees where services are outsourced. Manufacturers such as IGEL who make client management a key issue and whose solutions reflect the market needs of providers and users alike offer the best basis on which to permanently reduce TCO without investment risk and get IT workstations ready for the future.

[1] XaaS (or EaaS) means “Everything as a Service” (or “Anything as a Service”) and refers to an approach where “everything” is provided and consumed as a service. XaaS is the final step now that software, runtime environments and hardware are available as a service.

[2] Development of computer use in households, companies and government agencies in 2014, Dr. Ralph Hintemann, 2015

[3] Desktop as a Service (DaaS): With DaaS, a provider hosts virtual desktops including the operating system and specific applications. Users can add further apps via an optional user self-service.

[4] The term Client as a Service (ClaaS) refers to a scalable service where a provider offers a completely managed computer workplace on a rental basis – including a thin, zero or software thin client and remote management.

[5] “Ecological and economic aspects of software thin clients”, short title: Thin Clients 2015; Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT, 2015

[6] CAD: Computer Aided Design

[7] GIS: Geo-Information Systems

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